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REPORT OF THE BOARD OF MANAGERS

KINGSTON, R. I.

1931

PUBLISHED QUARTERLY BY THE COLLEGE

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RHODE ISLAND STATE COLLEGE

CORPORATION

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REPORT

To His Excellency Norman S. Case, Governor, and the Honorable General Assembly of the State of Rhode Island and Providence Plantations, at its January Session, 1931.

I have the honor to submit herewith the Forty-third Annual Report of the Board of Managers of Rhode Island State College, as required by law.

WALTER E. RANGER,
President, Board of Managers.

REPORT OF THE PRESIDENT OF THE COLLEGE

To the Board of Managers, Rhode Island State College:

GENTLEMEN: The following constitutes my report for the statistical year December 1, 1929, to November 30, 1930.

The outstanding event of the year 1930 in the history of the college was the death of President Howard Edwards on April 10. He had completed nearly twenty-four years of service as president of Rhode Island State College and had lived to see his plans for the development of the college in a large measure realized. The passing of this veteran leader removed from the field of education in our state one who had won for himself an exalted position by reason of his ripe scholarship, his fearless leadership, and singleminded devotion to the great task which was placed before him when he assumed charge of the college on July 1, 1906. The magnitude of this task and the courageous manner in which he faced it, his untiring devotion, wise foresight and masterly skill with which he addressed himself to the task is known to all but to none more intimately than to us who have served under his command here at the college. In his report to your Board in January, 1929, he devoted a considerable space to a summary of his twenty-two years' work and in his own graphic style pointed to the contrasts between conditions as he found them when he came here and as they are today. The college as we know it now is his accomplishment and his imperishable monument.

His passing cast a cloud over the activities of the institution where he had labored for so many years. Through all the events during the remainder of the year his unseen presence was felt. It was hard to realize that the familiar figure would be seen no more in our faculty meetings and assemblies, and that his inspiring words would no longer be heard.

The simple funeral service was conducted in the hall that bears his name. Dr. Edward Holyoke paid a beautiful tribute to his memory and he was laid to rest in Fernwood Cemetery upon the close of a beautiful spring day.

On May 19 a memorial service was held at which impressive tributes were paid to his memory by the Governor of the state and representatives of the Board of Managers, faculty, students, and alumni. These addresses have been printed in a suitable form and generally distributed.

Dr. Edwards published no books during his life, but he left behind the manuscripts of many public addresses that he gave during the active years of his life. These addresses contain so much of his wisdom and philosophy of life that it is hoped that they may be sometime gathered and published in a memorial volume.

Material Equipment

The last session of the legislature made provision for the construction of suitable buildings for the carrying on of an Egg-Laying Contest. The buildings have been completed and are situated on the East Farm. The contest itself began October 1 with all the houses occupied and is being successfully carried on under the immediate direction of Dr. J. C. Weldin.

During the past year a number of important improvements have been completed and necessary repairs made to the college buildings. The plan for an ample water supply for ordinary use and adequate for fire protection for all of the buildings has been carried forward by the completion of eight-inch water mains on the north, east, and most of the south sides of the quadrangle with service connections to all the larger buildings. In addition to many minor repairs and improvements the worn out heating system at the Experiment Station building has been replaced by a new connection with the central heating plant which provides more economical and efficient heating for this building. The water and steam piping in East Hall has been entirely replaced by brass pipes, and the bathrooms have had watertight floors laid. New hardwood floors have been laid in both dining rooms and in the serving rooms and a new water heater installed to provide hot water sufficient for kitchen and the men who occupy the dormitory. The greenhouse glass has been entirely reset and all of the metal work repainted.

The equipment for engineering instruction has been substantially improved by the purchase of a 200,000-pound testing machine, a Diessel Engine and other apparatus, and other departments have had some important improvements in their equipment.

Enrollment

Full details of the registration this year are given in the report of the registrar submitted with this report. It will be seen from this report that the total registration for this year is 634 as compared with 622 last year. The number of freshmen is 215 this year and 206 last year. There are 147 women this year and last year there were 146. The distribution of the students in the several courses shows a slight change from last year. Engineering and General Science have both gained in numbers at the expense of the other courses, but these changes are not sufficient to indicate any trend.

The writer was this year for the first time in intimate touch with the selection of the members of the freshman class. It is interesting to note the change that has taken place since Dr. Edwards came to this college. At the beginning of his administration 11 graduates of high schools applied for admission to this college. In 1930 436 applied; of these 215 were admitted. Most of those who were rejected lacked the necessary number of units but there was a considerable number who had the full number of units but lacked one or more required subjects. Public announcement was made early in August that more candidates had applied than could be taken into the freshman class and efforts were made to discourage further applications. In spite of this high school graduates continued to send in their records and many requests for consideration of candidates were received by letter and personal application so that while our records show only 16 fully qualified applicants that were refused admission the number who would have entered if they had been encouraged to apply is probably three or four times that number.

Gifts

We are glad to acknowledge the receipt this year of donations by several organizations of scholarship funds. Rhode Island State Grange gave $100 for two scholarships, one in agriculture and one in home economics. The Rhode Island State Federation of Women's Clubs gave $150 for three scholarships for young women, and the Triangle Club of Kingston gave $100 for two scholarships for young women.

On alumni day Mr. Israel Kaplan of the class of 1920 announced that he would give $25 annually for three years to the senior who combines in the highest degree scholarship, character, and extra-curricular ability, the first award to be made in 1931.

Two student organizations have again given scholarship prizes. The Pan Hellenic society and Chi Omega sorority each gave $25 for student prizes.

CHANGES IN PERSONNEL

The following changes in the personnel of the college have taken place during the calendar year 1930.

Resignations

On March 1, Mr. Nathaniel Helme resigned his position as Meteorologist of the Experiment Station. Mr. Helme was appointed to this position in 1893 and at the date of his resignation had been longest in service of the college of any person in its employ.

Mr. Donald E. Frear resigned on June 30. He had been Assistant Chemist at the Experiment Station for two years and withdrew to take a more desirable position.

Miss Berniece E. Neill resigned her position as Assistant Research Worker in Home Economics on August 31 in order to take up graduate work.

Mr. Samuel Allan Howes resigned his position as Instructor in Botany at the end of the college year to accept another teaching position.

Mr. Ralph D. Morrison withdrew from his position of Superintendent of Construction on August 31.

Mr. James R. Randolph, who had been appointed to carry on the work of Professor Webster in Civil Engineering during his illness, terminated his connection with the college at the end of the year.

Dr. Charles Carroll, who had given courses in Education, Rhode Island School Law, and the History of Education, was unable to continue with his work at the college because of the pressure of other duties at the College of Education and as Assistant Commissioner of Education and was obliged to relinquish his position at the end of the college year.

Mr. Harry S. Hall, who became Assistant Chemist at the Experiment Station earlier in the year, was obliged to relinquish his position in December because of illness.

Appointments

To fill the position left vacant by the resignation of Miss Berniece Neill, Mrs. Blanche Matheny Kuschke was appointed Assistant in Home Economics Research work in the Experiment Station and began her duties on September 1. Mrs. Kuschke is a graduate of Montana State College and has spent a year in postgraduate work and had several years' experience as supervisor and demonstrator in Home Economics.

With the establishment of the Egg-Laying Contest it was necessary to secure an experienced practical poultry man to superintend this work and for that purpose Mr. Thomas C. Higgins was appointed Plant Manager of the Department of Animal Breeding and Pathology of the Experiment Station. He began his duties on August 1.

Upon August 1, Mr. Harry S. Hall took up the position of Assistant Chemist at the Experiment Station made vacant by the resignation of Donald E. Frear. Mr. Hall is a graduate of Tufts College in the class of 1930. He was unfortunately incapacitated by serious illness after he had filled the position a little over four months and it was necessary for him to relinquish his position in December.

Late in December Mr. Donald R. Willard, a graduate of this college, was appointed to fill the position made vacant by the withdrawal of Mr. Hall and began his duties upon January 1, 1931.

Mr. Kenneth E. Wright was appointed Instructor in Botany and began his duties on September 1. He fills the position vacated by the resignation of Mr. S. A. Howes. Mr. Wright is a graduate of Ohio State University with the degree of B.S. in 1925. He spent two years in high school teaching and reentered the University in 1928 and has spent two years there in graduate work and teaching and has the degree of M.S. in Botany.

Mr. Robert A. DeWolf was appointed Instructor in Zoology to carry on part of the work in that department, as the writer was unable to do the work of teaching because of the burden of executive work. Mr. DeWolf is a graduate of Norwich University and has had several years of experience in zoological teaching.

Mr. Carroll D. Billmyer was appointed Assistant Professor of Civil Engineering and Superintendent of Construction. Prof. Billmyer is a graduate of Virginia Polytechnic Institute and of Shepard College State Normal School. For several years he was Assistant Professor in Georgia School of Technology and has had extended experience as Construction Engineer for several large corporations and at the time of his appointment was Engineer for the Atlas Portland Cement Company.

Changes in Title or Position

Mr. George H. Baldwin took over the classes in Education which were formerly conducted by Dr. Charles Carroll.

Mr. Crawford P. Hart was promoted from the position of Instructor to that of Assistant Professor of Poultry Husbandry.

Mr. William J. Champlin was made Meteorologist of the Experiment Station on August 1.

During the year Professor Harold W. Browning has been acting as Dean of Science.

Upon April 1 the writer was made Vice-President and upon April 10, at the death of Dr. Edwards, assumed the duties of President, and upon May 6 was designated Acting President.

Upon December 29, Mr. Raymond G. Bressler was appointed President to assume this position on April 1, 1931. Mr. Bressler brings to his new position an extended and varied experience. He has been awarded the degrees of A.B., Valparaiso Univ., 1908; M.S., Wofford College, 1910; M.S., University of Wisconsin, 1917, and B.S. in Agr. Education, Texas A. & M. College, 1918. He has also spent two years in study for his doctorate at Columbia University. Mr. Bressler is now Deputy Secretary of Agriculture at Harrisburg, Pennsylvania.

Commencement

Commencement week was held June 7 to 9. The senior class carried out its usual program on Saturday, June 7, and on Sunday, June 8, baccalaureate services were conducted in Edwards Hall. The address was given by the President of your Board, Hon. Walter E. Ranger, upon the subject *Youth's Adventure on the Conflicting Currents of Diverse Social Orders.*

On Monday, June 9, the thirty-seventh annual commencement was held in Edwards Hall. The usual program was followed. Greetings were given by the Governor, Hon. Norman S. Case, and Dr. Ranger. The address was given by the United States Commissioner of Education, Dr. William John Cooper. The Bachelor of Science degree was conferred upon 92 candidates, 5 in agriculture, 17 in business administration, 18 in general science, 22 in home economics, and 30 in engineering. For the first time a posthumous degree was conferred. Charles H. Holland died on December 2 and was given a degree with his class. The degree of Master of Science was conferred on 1 candidate. Three honorary degrees were conferred by concurrent action of your Board and the faculty. Hon. Charles F. Stearns, Chief Justice of the Supreme Court was given the degree of Doctor of Legal Letters; Mr. William T. Peck, for fifty years principal of Classical High School was given the degree of Doctor of Education, and Commissioner William John Cooper was made a Doctor of Literature.

During the nine months that have elapsed since my appointment as acting president the work has gone forward smoothly and efficiently and without friction or unfavorable incidents. I beg leave in closing to extend my thanks to the members of the faculty who have so loyally co-operated to carry on the important work of the institution and to your Board for the uniform consideration and support you have given me.

Respectfully submitted,

JOHN BARLOW,

Acting President.

February 19, 1931
Kingston, R. I.

Report of the Registrar

Attendance

TABLE NO. 1

Showing attendance by Classes during years 1926-1930

CLASS	1926–27	1927–28	1928–29	1929–30	1930–31
Graduate	3	4	2	1	2
Senior	94	83	96	98	97
Junior	97	110	120	110	152
Sophomore	138	124	130	201	162
Freshman	168	189	252	206	217
Irregulars	18	14	7	6	15
Total	518	524	607	622	645

TABLE NO. 2

Showing Number of Men and Women, of New and Previous Matriculates, and Number in the Several Courses by Classes for Collegiate Year 1930-1931

CLASS	SEX		DATE OF MATRICULATION	
	Men	Women	Previous to 1930	1930
Graduates	2	..	2	..
Senior	70	27	97	..
Junior	122	30	152	..
Sophomore	115	47	159	3
Freshman	177	40	6	211
Irregulars	11	4	8	7
Grand Total	497	148	424	221

Class	Agri.	Engineering					Gen. Sci.	Home Ec.	Bus. Ad.	Ed.	Total
		Civil	Chem.	Elec.	Mech.	Total					
Senior	5	13	7	7	9	36	21	18	17	.....	97
Junior	6	25	10	18	23	76	27	24	19	.....	152
Sophomore	6	18	12	12	25	67	36	34	19	.....	162
Freshman	5	.....	.....	.....	.....	109	50	23	30	.....	217
Irregulars	.....	.....	.....	.....	.....	1	5	1	.....	8	15
Grand Total	22	56	29	37	57	289	139	100	85	8	643

	Men	Women
Students boarding at the college	353	119
Students not boarding at the college	129	25

Home Residence of Students Enrolled in Four-Year Courses

A. Resident outside of the State:

China:
- Shanghai 1

India:
- Bannu 1

Spain:
- Barcelona 1

Connecticut:
- Danielson 1
- Farmington 2
- Mystic 1
- New Haven 3
- Oakdale 1
- Saybrook 1
- Stonington 2
- Thomaston 1

12

Illinois:
- Galesburg 1

Maine:
- North Waterford 1

Massachusetts:
- Attleboro 5
- Barrowsville 1
- Brockton 8
- Brookline 1
- Campello 2
- Chicopee Falls 5
- Dorchester 1
- East Dennis 1
- Fairhaven 2
- Fall River 7
- Gardner 2
- Haverhill 1

Lawrence	1
Lowell	1
Malden	1
Middleboro	2
Needham	1
New Bedford	2
North Attleboro	3
Pottersville	1
Provincetown	1
Quincy	1
Rehoboth	1
Revere	3
Roslindale	1
Seekonk	1
Springfield	3
Taunton	2
Three Rivers	1
Webster	1
Whitman	1
Willimansett	1
Worcester	2
	67

Michigan:	
Detroit	1
New Jersey:	
Clifton	1
Elizabeth	1
Garwood	1
Hawthorne	1
Kenilworth	1
Lodi	1
Passaic	1
Roselle Park	6
	13
New York:	
Albany	1
New York City	1
Rossville, Long Island	1
	3
Pennsylvania:	
Childs	1
Hazelton	1
	2

Total attendance from outside the State 104

B. Resident in Rhode Island by Counties and Towns:

Bristol:	
Barrington	1
Bristol	12
Warren	5
	18
Kent:	
Coventry	4
East Greenwich	12
Warwick	10
West Warwick	7
	33
Newport:	
Jamestown	5
Newport	36
New Shoreham	1
Portsmouth	2
	44

Providence:	
Burrillville	5
Central Falls	6
Cranston	50
Cumberland	1
East Providence	22
Glocester	1
Johnston	2
Lincoln	9
North Providence	4
Pawtucket	42
Providence	192
Scituate	2
Smithfield	1
Woonsocket	23
	360
Washington:	
Hopkinton	2
Narragansett	3

North Kingstown	3
Richmond	4
South Kingstown	33
Westerly	24
	69
Total attendance from within the State	524

Preparatory Schools Represented in Freshman Class

In Rhode Island:	
Bristol:	
Colt Memorial High	3
Burrillville High	1
Central Falls High	2
Cranston High	16
East Greenwich Academy	5
East Providence High	6
Newport:	
De La Salle	1
Rogers High	9
Pawtucket Senior High	15
Providence:	
Classical High	6
Commercial High	3
Hope Street High	11
La Salle Academy	14
St. Mary's High	1
St. Xavier's Academy	4
Technical High	37
South Kingstown High	17
Warren High	1
Warwick High	3
West Warwick High	3
Westerly High	7
Woonsocket High	6
Mt. St. Charles Academy	1
	172
In Connecticut:	
New Haven High	2
Old Saybrook High	1
Stonington High	3
	6
In Georgia:	
Atlanta:	
School of Technology	1
In Maine:	
Bucksport Seminary	1
Bridgton Academy	1
	2
In Massachusetts:	
Brockton High	3
Attleboro High	2
Chicopee High	4
Dennis High	1
Fairhaven High	1
Fall River:	
B. M. C. Durfee High	5
Gardner High	2
Lawrence High	1
Middleboro:	
Memorial High	1
New Bedford High	2
North Attleboro High	1
Provincetown High	1
Taunton High	1
	25
In New Hampshire:	
Kingston:	
Sanborn Seminary	1
New Hampton High	1
	2
In New Jersey:	
Elizabeth High	1
Passaic High	1
Roselle Park High	1
	3

In Pennsylvania:		In Spain:	
Hazelton City High	1	Barcelona:	
Pittston High	1	The English School	1
	2	In Texas:	
		San Antonio:	
		Brackenridge High	1

Total number of students received from high school	208
Total number of students re-classified and repeating work	5
Total number of students transferred from other colleges	4
Total number of students classified as freshmen	217

Average age of men and women, Oct. 1, 1930—18 years, 6 months, 16 days
Age of youngest member of class, Oct. 1, 1930—16 years, 6 months, 22 days
Age of oldest member of class, Oct. 1, 1930—26 years, 4 months, 17 days

REPORT OF THE TREASURER

R. S. BURLINGAME, *Treasurer, in account with the different funds of Rhode Island State College for 7 months ending June 30, 1930*

EXPENDITURES	Morrill 1890	Morrill 1862	Capper-Ketcham	Smith-Lever	State Maintenance	Current	Trust	Bond Issue	Totals
Salaries	$23,199.14	$2,657.42	$10,135.20	$3,579.64	$58,224.96	$2,379.98	$550.00	.....	$100,726.34
Wages	.....	.....	.....	.....	23,975.04	4,400.33	19,006.35	.....	47,381.72
Special Services	.....	.....	.....	.....	.....	1,068.00	.....	.....	1,068.00
Traveling	.....	.....	.....	1,371.22	32.33	1,638.58	871.59	.....	3,913.72
Freight and Express	.....	.....	.....	1.40	.....	944.89	447.84	.....	1,394.13
Telephone and Telegraph	.....	.....	.....	.....	.....	865.49	.....	.....	865.49
Postage	.....	.....	.....	.60	.....	326.47	.....	.....	327.07
Printing and Binding	.....	.....	.....	148.00	.....	482.68	.....	.....	630.68
Advertising	.....	.....	.....	.....	.....	220.40	.....	.....	220.40
Light, Heat, etc	.....	.....	.....	.....	.....	2,909.44	.....	.....	2,909.44
Motor Vehicle Expense	.....	.....	.....	.....	.....	1,130.44	.....	.....	1,130.44
Subscriptions	.....	.....	.....	.....	.....	682.61	.....	.....	682.61
Other Expenses	.....	.....	.....	.....	.....	1,181.44	38.95	.....	1,220.39
Refunds	.....	.....	.....	.....	.....	108.82	3,748.58	.....	3,857.40
Rentals	.....	.....	.....	.....	2,767.67	15.00	.....	.....	2,782.67
Food	.....	.....	.....	.....	.....	.....	37,741.15	.....	37,741.15
Forage	.....	.....	.....	.....	.....	4,018.81	.....	.....	4,018.81
Fuel	.....	.....	.....	.....	13,000.00	2,508.71	938.63	.....	16,447.34
Office Supplies	.....	.....	.....	852.67	.....	991.52	5.92	.....	1,850.11
Laundry, Cleaning and Sanitary	.....	.....	.....	.....	.....	501.18	1,416.38	.....	1,917.56
Educational	.....	.....	.....	.....	.....	3,270.53	.....	.....	3,270.53
Recreational	.....	.....	.....	.....	.....	1,184.24	.....	.....	1,184.24
Agricultural and Botanical	.....	.....	.....	.....	.....	1,422.68	.....	.....	1,422.68
Other Supplies	.....	.....	.....	132.99	.....	2,281.88	3,905.78	.....	6,320.65
Repair Labor	.....	.....	.....	.....	6,540.63	26.03	269.55	.....	6,836.21

	Morrill 1890	Morrill 1862	Capper-Ketcham	Smith-Lever	State Maintenance	Current	Trust	Bond Issue	Totals
Building Repair Material	.....	.....	.....	.....	$1,779.42	$142.70	.....	.....	$1,922.12
Heating and Plumbing Repair Material	.....	.....	.....	.....	2,805.45	105.22	$83.18	.....	2,993.85
Electrical Repair Material	.....	.....	.....	.....	472.18	162.84	.....	.....	635.02
Equipment Repair Material	.....	.....	.....	.....	586.76	429.25	292.40	.....	1,308.41
Contract Repairs	.....	.....	.....	.....	315.56	.....	.....	.....	315.56
Floor Coverings	.....	.....	.....	.....	.....	122.20	.....	.....	122.20
Curtains and Draperies	.....	.....	.....	.....	.....	18.53	3.41	.....	21.94
Kitchen Ware	.....	.....	.....	.....	.....	.....	199.38	.....	199.38
Dining Room Ware	.....	.....	.....	.....	.....	.....	526.03	.....	526.03
Replacements	.....	.....	.....	.....	9,755.00	52.12	101.92	.....	9,909.04
Other Furnishings	.....	.....	.....	.....	.....	52.50	15.50	.....	68.00
Office Furniture and Equipment	.....	.....	$264.20	$421.83	753.35	19.90	.....	.....	1,459.28
Household Furniture and Equipment	.....	.....	.....	.....	8.97	.....	.....	.....	8.97
Medical and Laboratory Equipment	.....	.....	.....	.....	123.29	.....	.....	.....	123.29
Educational Equipment	.....	.....	.....	26.97	11,128.44	709.75	.....	.....	11,865.16
Agricultural and Farm Equipment	.....	.....	.....	.....	$2,179.92	.....	.....	.....	2,179.92
Scientific Equipment	.....	.....	.....	145.21	.....	.....	.....	.....	145.21
Classroom Equipment	.....	.....	.....	.....	243.80	.....	.....	.....	243.80
Other Equipment	.....	.....	.....	284.50	100.23	29.43	8.23	.....	422.39
Power Plant	.....	.....	.....	.....	53.79	.....	.....	.....	53.79
Valves	.....	.....	.....	.....	890.00	.....	.....	.....	890.00
Total	$23,199.14	$2,657.42	$10,399.40	$6,965.03	$135,736.79	$36,404.59	$70,170.77	.....	$285,533.14

RECEIPTS	Morrill 1890	Morrill 1862	Capper-Ketcham	Smith-Lever	State Maintenance	Current	Trust	Reserve	Totals
Balance on hand, December 1, 1929	$23,199.14		$12,703.39	$7,667.30	.....	$1,498.49Dr.	$14,892.48	$2,000.00	$58,963.82
Federal Appropriation, 1929-1930	.....	$2,657.42		.....	.....	.....	.....	.....	2,657.42
State Appropriation	.....	.....	.....	.....	$138,735.00	.....	.....	.....	138,735.00
Transfer	.....	.....	.....	.90	.....	.....	.....	2,000.00	2,000.90
Accounts Receivable	.....	.....	.....	.....	.....	1,364.09	.....	.....	1,364.09
Department Sales	.....	.....	.....	.....	.....	20,425.04	.....	.....	20,425.04
Department Service	.....	.....	.....	.....	.....	1,707.93	.....	.....	1,707.93
Dormitory Fees	.....	.....	.....	.....	.....	4,119.98	.....	.....	4,119.98
Laboratory Sales	.....	.....	.....	.....	.....	4,112.81	.....	.....	4,112.81
Department Fees	.....	.....	.....	.....	.....	2,932.40	.....	.....	2,932.40
Interest	.....	.....	.....	.....	.....	832.81	.....	.....	832.81
Vocational Education	.....	.....	.....	.....	.....	500.00	.....	.....	500.00
Tuition	.....	.....	.....	.....	.....	2,297.50	.....	.....	2,297.50
Refunds	.....	.....	.....	.....	.....	298.74	.....	.....	298.74
Boarding	.....	.....	.....	.....	.....	.....	49,109.26	.....	49,109.26
Bookstore	.....	.....	.....	.....	.....	.....	4,800.13	.....	4,800.13
Military Sales	.....	.....	.....	.....	.....	.....	890.70	.....	890.70
Furniture Sales	.....	.....	.....	.....	.....	.....	4.75	.....	4.75
Advanced Dairy Registry	.....	.....	.....	.....	.....	.....	2,475.35	.....	2,475.35
Poultry Testing	.....	.....	.....	.....	.....	.....	2,058.50	.....	2,058.50
Evening Schools	.....	.....	.....	.....	.....	.....	1,215.00	.....	1,215.00
Total	$23,199.14	$2,657.42	$12,703.39	$7,668.20	$138,735.00	$37,092.81	$75,446.17	$4,000.00	$301,502.13
Expenditures	23,199.14	2,657.42	10,399.40	6,965.03	135,736.79	36,404.59	70,170.77	.....	285,533.14
Balance			*2,303.99	*$703.17	†$2,998.21	$688.22	$5,275.40	$4,000.00	**$15,968.99

*Balance reverting to Federal Treasurer.
†Balance reverting to State Treasurer.
**Of this balance $2,998.21 reverts to State Treasurer.
**Of this balance $3,007.16 reverts to Federal Treasurer.

EXPENDITURES	Hatch	Adams	Purnell	Misc.	Feeding Stuffs	Fertilizer Control	State Egg-Laying Contest	Totals
Building and Land	$251.06	$203.18	$718.18	$813.09	.....	.....	$55.09	$2,040.60
Communication Service	144.93	1.50	136.02	.90	$13.25	.....	.....	296.60
Feeding Stuffs	155.82	372.86	461.99	.....	.....	.....	.....	990.67
Fertilizers	316.48	210.50	299.50	.....	.....	.....	.....	826.48
Furniture	10.27	.....	54.15	.....	.....	.....	.....	64.42
Heat, Light, Water and Power	180.45	208.83	234.66	.....	36.76	$131.26	.....	791.96
Labor	2,085.43	1,719.34	3,959.85	.....	.....	60.00	.....	7,824.62
Library	39.30	.....	48.02	6.00	4.00	.....	.....	97.32
Publications	554.34	.....	657.19	.....	97.75	.....	.....	1,307.28
Salaries	4,201.23	5,670.53	20,838.48	.....	1,000.00	3,066.68	.....	34,776.92
Scientific Equipment	32.14	274.42	34.38	.....	.....	.....	.....	340.94
Scientific Supplies	15.66	227.99	97.95	.....	36.43	165.35	.....	543.38
Stationery and Office Supplies	106.21	2.99	77.69	1.20	5.00	15.29	.....	208.38
Sundry Supplies	557.13	58.88	273.93	33.08	23.52	11.88	.....	958.42
Tools and Machinery	161.85	11.70	329.76	66.44	.....	.....	.....	569.75
Transportation	87.85	22.06	56.84	11.64	.....	13.60	.....	191.99
Traveling	274.80	.....	435.22	6.62	85.20	131.65	.....	933.49
Contingent Expenses		.....	.....	17.00	.....	5.00	.....	22.00
Total	$9,174.95	$8,984.78	$28,713.81	$955.97	$1,299.91	$3,600.71	$55.09	$52,785.22

RECEIPTS	Hatch	Adams	Purnell	Misc.	Feeding Stuffs	Fertilizer Control	State Egg-Laying Contest	Totals
Balance on hand, December 1, 1930	$9,174.95	$8,984.78	$28,713.81	$2,386.29Dr.	.....	.....	.....	$44,487.25
Department Sales	.....	.....	.....	2,874.32	.....	.....	.....	2,874.32
Department Service	.....	.....	.....	210.90	.....	.....	.....	210.90
Dormitory Fees	.....	.....	.....	90.00	.....	.....	.....	90.00
Refund	.....	.....	.....	16.10	.....	.....	.....	16.10
Interest	.....	.....	.....	193.14	.....	.....	.....	193.14
State Appropriation	.....	.....	.....	.....	$1,300.00	.....	$12,000.00	13,300.00
Fees	.....	.....	.....	.....	.....	$4,168.00	.....	4,168.00
Totals	$9,174.95	$8,984.78	$28,713.81	$998.17	$1,300.00	$4,168.00	$12,000.00	$65,339.71
Expenditures	9,174.95	8,984.78	28,713.81	955.97	1,299.91	3,600.71	55.09	52,785.22
Balance	.....	.....	.....	$42.20	**$.09	$567.29	$11,944.91	‡$12,554.49

**Balance reverting to State Treasurer.

‡9 cents of this amount reverts to State Treasurer.

I hereby certify that the above is correct and true, and truly represents the details of expenditures for the period and by the institution named.

R. S. BURLINGAME,

Treasurer.

This is to certify that we, the undersigned, Auditing Committee of the Board of Managers of Rhode Island State College, have examined the accounts of R. S. Burlingame, Treasurer of said college, and find the same correct.

THOMAS G. MATHEWSON,
CHARLES ESTES,

Auditors.

Summaries Dealing with Certain Phases of Receipts and Expenditures for the Year Ending June 30, 1930

Summary for the Year

Balance on hand, July 1, 1929	$104,978.12
Less amount reverting to Federal and State Treasurer	9,178.83
Total	$95,799.29
Total income during year	517,632.97
Total	$613,432.26
Total expenditures during year	585,476.16
Balance on hand, July 1, 1930	$27,956.10

Income

Income from Students:			
Tuition fees	$4,685.00		
Matriculation and Incidental fees	5,940.65		
Chemicals and Laboratory fees	4,166.58		
Dormitory fees	8,355.50		
Dining Halls	100,285.69		
Store sales	12,422.91		
			135,856.33
Income from State and Nation:			
State Maintenance	$138,735.00		
Morrill Act of 1890	50,000.00		
Morrill Act of 1862	2,657.42		
Hatch Fund of 1887—Experiment Station	15,000.00		
Adams Fund of 1906—Experiment Station	15,000.00		
Purnell Fund of 1923—Experiment Station	60,000.00		
Smith-Lever Act of 1914—Extension	11,680.24		
Capper-Ketcham Fund of 1928—Extension	20,147.57		
State Egg-Laying Contest	12,000.00		
			325,220.23
Income from Other Sources:			
Department Sales and Service	$48,813.39		
Interest	1,334.75		
Experiment Station:			
Department Sales and Service	$6,117.71		
Interest	290.56		
		6,408.27	
			56,556.41
Total Income			$517,632.97

Receipts from Tuition:

Students taking course of one year or more.	615
Students paying tuition (non-resident in Rhode Island) at the rate of $50 per year	103
Amount of tuition paid	$4,685

Expenditures

Expenditures, Exclusive of Experiment Station and Extension Service:

Agricultural and Botanical	$1,954.77	
Advertising in Publications	350.10	
Educational	15,439.43	
Equipment and Furniture	17,856.63	
Forage and Veterinary Supplies	6,955.82	
Freight and Express	2,488.93	
Fuel	25,794.50	
Furnishings and Replacements	21,689.82	
Labor	76,173.20	
Light, Heat and Power	5,095.52	
Motor Vehicle Expense	1,887.95	
Office Supplies	1,591.33	
Permanent Improvements	4,179.09	
Postage	765.97	
Power Plant	855.49	
Printing	1,118.92	
Provisions	60,299.57	
Recreational	1,916.66	
Refrigerating Supplies	71.21	
Refunds	3,422.26	
Rental	4,765.16	
Repairs	34,556.72	
Salaries	146,787.54	
Sanitary Supplies	3,621.89	
Special Services	1,289.00	
Subscriptions	936.57	
Telephone and Telegraph	1,500.15	
Traveling	4,310.19	
Miscellaneous	11,863.18	
		$459,537.57
Expenditures, Experiment Station	96,917.94	
Expenditures, Extension Service	28,820.65	
Expenditures, Buildings, Bond Issue	200.00	
		$585,476.16

ANALYSIS OF BALANCE, JULY 1,

	1929	1930
Morrill Fund of 1890	$	$
Morrill Fund of 1862		
Smith-Lever Fund—Extension Service	310.44	703.17
Capper-Ketcham Fund—Extension Service	8,668.39	2,303.99
Hatch Fund—Experiment Station		
Adams Fund—Experiment Station		
Purnell Fund—Experiment Station		
Miscellaneous—Experiment Station	496.78	42.20
State Egg-Laying Contest		11,944.91
State Maintenance	88,757.72	2,998.21
Current Fund	467.14Dr.	688.22
Trust Fund	5,011.93	5,275.40
Reserve Fund	2,000.00	4,000.00
Bond Issue	200.00	
	$104,978.12	$27,956.10

STUDENT ACTIVITIES ACCOUNT

			Dr.	Cr.
By Balance brought forward from last year				$702.14
Receipts during year:				
(a)	Student Tax	$11,414.50		
(b)	Season Tickets	260.00		
(c)	Interest	51.18		
				11,725.68
To	Baseball		$1,971.81	228.75
	Basketball		2,290.56	735.10
	Beacon		594.00	
	Football		8,012.35	5,712.90
	Freshman Athletics		84.00	
	Glee Club		226.14	50.00
	Key Fund		3.00	
	Lecture Association		360.00	
	Loans			531.00
	Orchestra		66.00	
	Phi Kappa Phi		54.00	
	Tax		1,001.65	234.00
	Track		1,281.49	326.72
	Young Women's Athletic Association		308.40	
	Young Women's Student Government		10.43	
	Balance on hand, September 1, 1930		3,982.46	
			$20,246.29	$20,246.29

Alumni Student Loan Fund

By amount of Contribution to July 1, 1929		$1,194.58
By amount of Interest to July 1, 1929		414.21
By amount of Interest during 1929-1930		29.91
To Loans out, July 1, 1930	$1,413.00	
Cash on hand	225.70	
	$1,638.70	$1,638.70

Campus Clock Fund

By gifts from Senior classes, 1908-1919		$226.41
By accrued interest		244.04
		$470.45

Frederick Roy Martin Student Loan Fund

By amount of fund received June, 1925		$150.00
By amount of interest accrued		32.42
		$182.42
To loans out		179.50
		$2.92

Scholarship Funds

Rhode Island State Grange		$100.00
To award in Agriculture to Leroy Harlan Hersey	$50.00	
Home Economics to Frances Wright	50.00	
	$100.00	$100.00
Rhode Island State Federation of Women's Clubs		$150.00
To award to Muriel Grace Fletcher	$50.00	
Virginia Bernadine Lovejoy	50.00	
Alice Irene Tew	50.00	
	$150.00	$150.00
Triangle Club of Kingston		$50.00
To award to Clara Marjorie Burton	$50.00	
	$50.00	$50.00
Panhellenic Association		$25.00
To award to Mary Evans Chase	$25.00	
	$25.00	$25.00
Women's Student Government		$25.00
To award to Mary Evans Chase	$25.00	
	$25.00	$25.00
Chi Omega Economics Prize		$25.00
To award to Muriel Grace Fletcher	$25.00	
	$25.00	$25.00

FORTY-THIRD ANNUAL REPORT OF THE DIRECTOR OF THE AGRICULTURAL EXPERIMENT STATION*

ACTING PRESIDENT JOHN BARLOW,
Rhode Island State College.

DEAR SIR:

I have the honor to submit to you the Forty-Third Annual Report of the Rhode Island Agricultural Experiment Station.

Buildings and Lands. Certain major changes have taken place during 1930. The transference of the experimental poultry department to the East Farm has been completed. A gravel road has been constructed so that visitors may drive through the grounds, and landscaping around the buildings has been begun. A storage cellar for the wintering of pomology stock has been built. On the old plain farm a much needed implement shed is in the course of erection. Cement soil bins have been constructed where experimental work in agronomy can be carried out under controlled soil conditions. A drying room of considerable volume for the drying of crop samples under automatically controlled conditions has been equipped.

Egg-Laying Contest. During the General Session of 1929-30 the sum of $12,000 was appropriated for the purpose of erecting and equipping an egg-laying contest plant. Much interest in this project was shown by poultrymen of the state and while not of research nature there seemed an opportunity to render a distinct type of service. Therefore under the supervision of the poultry department of the experiment station buildings were erected and equipped on the East Farm. The first Rhode Island Egg-Laying Contest began on October 1, 1930, with 50 entries of which 44 were from Rhode Island poultrymen.

In addition to the experimental program of the year a Field Day for golf greenkeepers was held on May 26, 1930, with a very gratifying attendance. Much interest was shown in the experiments on turf culture under way on the plain farm.

*Contribution No. 406. In Bulletin of Rhode Island State College Vol. XXVI, February, 1931.

Through cooperation with the Extension Department of the college a monthly letter has been sent to market gardeners describing the progress of the experiments being carried on with vegetable crops.

During the winter months of 1929-30 a series of seminar talks was given by members of the staff of the station which served to keep all in touch with the activities of the station.

The following research projects have been terminated during the years 1928-1930 inclusive:

Adams Fund.
- Toxic factors of acid soils.—Physiological studies.
- Toxic factors of acid soils.—Chemical studies.
- Phenomena accompanying different degrees of soil acidity.
- Physiological relationships of nutrient elements to plant growth.
- Inheritance of egg-weight.

Purnell Fund.
- Inheritance of body-weight and certain other characters in poultry (terminated except for publication.)
- Use of time by rural homemakers.
- Nervous disorder in the adult fowl, commonly known as fowl paralysis.
- Determination of the ratios of fertilizer ingredients best suited to meet normal relative requirements of crops.

The more important lines of work to which members of the research staff have given attention during 1930 are discussed. Where possible, reports of progress and results of research are given. Many of the latter, however, can be regarded only as trends or impressions until established by further experimentation.

Agricultural Economics

Farm Business Records. Records of the business during 1929 on 142 farms in 5 areas of the state were obtained. These farms were located as follows: 10 in Jamestown; 49 in Portsmouth; 47 in Cranston and Johnston; 13 in Coventry and West Greenwich; and 23 in Richmond and South Kingstown. The gross business was less than $1,500 on 18 farms. The average gross re-

ceipts on the 124 farms having a business of $1,500 or more were $6,647 per farm and the average labor income was $316 per farm. The three major sources of income were dairy cows, poultry, and vegetables. Expenses were $5,686 per farm. Important items of expense were grain, labor, and on dairy farms, the cost of replacements. The estimated value of farm products used in the home was $311 per farm. The range in the man-labor requirements for hay on 8 farms in 1930 was from 4.5 man hours to 25.7 hours per acre. The range in horse labor was from 4.3 hours to 22.1 hours per acre. The average was 13.5 man hours and 9.4 horse hours per acre. The man labor ranged from 4.0 hours to 16.0 hours per ton, and the horse labor from 3.0 hours to 10.1 hours per ton. The average labor required per ton was 7.9 man hours and 5.5 horse hours. The variations between farms were due to differences in the size and shape of the fields, in the soil and topography, in yields, in equipment, and in the efficiency of management.

Studies in Connection with the Providence Milk Supply. Drastic changes in the sources of the Providence milk supply have occurred during the year. In response to the need for some factual evidence on the shipped-in supply of milk, data were gathered showing that approximately 7,500,000 quarts were shipped into the city in 1929. Vermont was the source of about 85 per cent of this volume. It is expected that this study will be continued and enlarged to show the trend of shipped-in milk supplies and the changes in quantity received during different seasons of the year.

Recent ordinances requiring milk to meet certain temperatures when received at Providence milk plants raised the question of the most economical methods of cooling milk on farms (Rhode Island Bulletin 223). Eleven farms using electrical equipment with "dry" cold-chambers showed an average cost of cooling of 14½ cents per 100 pounds of milk, while 19 farms with "wet" cold-chambers showed an average cost of 12 2/3 cents per 100 pounds of milk. Among the 19 farms with wet tanks the costs varied from 3 1/3 cents to 37 2/3 cents for each 100 pounds of milk produced. The most important factor in this variation in cost was the volume of milk to be cooled. On 24 farms where

ice was purchased and delivered to the farm the average cost of ice was 42 cents for 100 pounds. An average of 22 pounds was used to cool each 100 pounds of milk produced. Under these conditions the total cost of cooling was about 10 cents for 100 pounds of milk.

Container Studies with Apples. The increasing quantities of the easily bruised McIntosh apple coming into New England markets have made the container question more acute. Apples similar in variety, grade, and size were packed in four kinds of containers: (1) Round-bottom bushel baskets; (2) tub bushel baskets; (3) Boston boxes, and (4) Northwest boxes. The packages were placed in cold storage and examined at periods throughout the storage season. There was more bruising in the round-bottom baskets than in the other containers. Wrapping apples reduced the amount of stem puncture, which is often associated with rot. There was an appreciable difference between the weights of the fruit in the different containers. The Northwest box held less fruit than the others. In the New York market fruit packed in the Northwest box sold for a premium over that in the other containers, although the fruit was as nearly identical as commercial conditions would allow.

Agronomy

(Experiments with field crops, market-garden crops, and grasses for lawns and golf courses)

The past season was characterized by several very dry periods which had a marked influence on some of the crops grown. In several instances results obtained in certain experiments were rather inconsistent with the average of previous years due to the dry weather. For most crops, however, there was sufficient moisture and satisfactory yields were obtained.

Organic Matter for the Soil. A number of experiments at the station have for their object the determination of the amount of organic matter necessary for vegetable growing. In one experiment an annual application of 10 cords of manure is compared with green manure and chemicals. A rye cover crop is plowed in on the green manure-chemicals plat while it is cut and removed on the manure plat.

This year Greater Baltimore tomatoes were grown on these plats. The green manure-chemicals plat yielded about 25 per cent more of No. 1 tomatoes than the stable-manure plat. The crop also was considerably earlier on the green-manure plat.

In the 3-year rotation where the first crops are beets, spinach, and peppers, the beets yielded as well with 16 tons of manure where a green manure had been plowed in once during the round of the rotation, as with 32 tons of manure-compost, the fertilizer being the same. Spinach and peppers did not yield as well with the 16 tons as with the 32 tons. Reducing the nitrogen to one half of the standard reduced the yield of spinach but not the yield of either beets or peppers. Reducing the phosphorus lowered the yield of peppers but not of beets or spinach. The yield of late carrots in this rotation was reduced where the nitrogen was decreased by 50 per cent.

In another 3-year rotation the plats where 8 tons of manure-compost and green manure were applied outyielded plats receiving 20 tons of manure-compost without green manure. In each case the fertilizer applied was approximately 1,500 pounds of a 5-12-4. The yield of early cabbage was as large with 1,500 pounds of an 8-6-6 fertilizer as with either 8 tons of manure or with a green-manure crop and a like fertilizer. Reducing the nitrogen by 50 per cent lessened the yield by fully 100 barrels per acre but a reduction of phosphorus did not reduce the yield. The fertilizer for celery consisted of 1,500 pounds per acre of a 6-8-6. Where manure was used the yields were better than where green manures had been plowed in. Twenty tons of manure-compost produced as high yields as 28 tons of this material when used with the same amount of commercial fertilizer. Applying all the fertilizer when the plants were set in the field was as effective as applying part of the nitrogen during the growing season in side-dressings for the celery.

Efficiency of Fertilizers and Manures. On the various field-crop rotations in which no stable manure is used, rye was grown this year following the potato crop of 1929. The yields varied from 14.7 to 33.7 bushels per acre. A yield of 19.7 bushels per acre was obtained where no nitrogen is used in the fertilizer. On this plat 500 pounds per acre of a fertilizer analyzing approximately

0-8-8 was used. When the same amount of a 2-8-8 was used the yield was 23.4 bushels per acre and where the high nitrogen 4-8-8 fertilizer was applied the yield obtained was 34.6 bushels. Clover and grass is seeded with the rye for the two following years of the rotation. Better stands of clover were obtained on the no and medium-nitrogen plats than on the plat receiving the high nitrogen. The rye crop on the other plats responded with higher yields when the phosphorus was increased but not to increased potash. In another set of plats the yield of rye was reduced from 19.2 bushels per acre to 14.7 bushels when the amount of a 2-8-8 fertilizer was reduced from 500 to 316 pounds per acre. The yield was increased to 23.9 bushels when the amount of fertilizer was increased to 667 pounds per acre.

Bulletin No. 224, published in August, 1930, summarizes the results obtained in the field crop-rotation experiments up to this year.

Beets did not respond to manganese applications on neutralized soil as much as in previous years. Spinach showed the effects of lack of manganese under those conditions but not as much as in more normal years.

Plant Differences and Needs. Seven varieties of sweet corn were grown crosswise of the plats of the winter legume experiment. Golden Gem, a variety bred at the North Dakota station, was the earliest of these strains. Spanish Gold, bred at the Connecticut station, was about 3 or 4 days later but had a considerably larger ear. The others in order of maturity were Gills Golden Market, Golden Age, Harris' Extra Early Bantam, Golden Sunshine, and Whipple's Yellow. Spanish Gold produced the largest number of ears per acre. The ears were of medium size. Whipple's Yellow produced the largest ears but the fewest in number. The Golden Gem, although early, has an ear that is too small to be in the best market demand.

In the potato seed-source test there were 60 different lots of seed included this year. These were obtained from potato growers throughout the state. The results obtained this year were:

		Average yields per acre Bushels
Cobblers	Northern-grown	398
"	1 year home-grown	366
"	2 years home-grown	293
Green Mountain	Northern-grown	367
" "	1 year home-grown	289
" "	2 years home-grown	270

The past season proved to be very favorable for potatoes at the station and excellent yields were obtained on all plats where northern-grown seed and the proper fertilizer were used.

Paper mulch was compared with ordinary cultivation on tomatoes, sweet corn, and peppers. All three crops yielded more and were earlier where the paper mulch was used. The results were not as marked, however, as they were in 1929.

In the plant breeding nursery another generation of selfed seed of alfalfa was grown. There are about 45 different selfed strains being grown. Selections of head lettuce and eggplants have also been made for the purpose of plant breeding studies.

In the market-garden rotations where different rations of nitrogen, phosphorus, and potash in the fertilizer are compared it was found that the crops responded as follows:

To nitrogen: Late beets, late spinach, late carrots, and early cabbage.
To phosphorus: Tomatoes.
To potash: Late spinach, late beets, and late celery.

The crops above are listed in the order in which they were reduced in yields by either reducing or omitting the element named.

In the same market-garden rotations all the fertilizer was applied at planting time on some plats while on others some of the nitrogen was withheld at planting time and applied later as side-dressings. The results obtained were as follows:

In favor of all fertilizer in one application: Late celery.
In favor of part of nitrogen as side-dressings: Early lettuce.
No appreciable difference: Cabbage, tomatoes, late beets, and spinach.

Increasing the standard fertilizer application by 75 per cent, the standard application being 1,500 pounds per acre, increased the yields of head lettuce, celery, beets, tomatoes, and spinach, but not of cabbage. The increases were sufficient to make the extra investment in fertilizer a paying proposition. Increasing the amount to 150 per cent did not produce further increases in yield but in several cases resulted in less yields.

Potatoes, onions, carrots, mangels, and tomatoes were grown on the plats where different potash carriers are compared. Kainit and muriate produced better yields of carrots, mangels, and tomatoes than did sulphate of potash or double manure salt. The kind of carrier did not affect the onion yields. Muriate and sulphate produced about equal yields of potatoes and were both superior to kainit and double manure salt.

On the project where the influence of previous crops on a succeeding uniform crop is studied the following crops were grown as the uniform treatment: Potatoes, corn, mangels, and turnips. The yields of potatoes were the best following oats, rye, squash, and redtop, and the poorest following cabbage and millet. The highest yields of mangels were produced following potatoes and squash while the poorest results were obtained following a previous crop of mangels. Turnips yielded highest following redtop and least succeeding a previous crop of turnips. The differences in yields of corn were not large from the different plats although this crop seemed to do less well succeeding itself than following any other crop.

Modification of Sour Soil. The ornamental shrubs, which are being grown on the plats where nitrate of soda and sulphate of ammonia are being compared on two different acidity levels, withstood the winter well and further data on their growth were obtained. Several species continue to show a marked response to liming. The pH of the plats receiving sulphate of ammonia is kept approximately the same as that of the nitrate of soda plats by using additional lime.

Lawn Grass Experiments. Further data on the effect of soil reaction on the growth of different lawn grasses were obtained. The plats having the alkaline reaction made the most vigorous

growth especially in the early part of the season but continue to have many more weeds than the acid plats. Kentucky bluegrass is benefited by liming after the soil reaches a pH of 4.5 to 5.0.

Seed Production of Bent Grasses. Seed was harvested from all the different strains included in this test which were planted either in 1928 or 1929. Some of the bent grasses are much more prolific seed producers than others. One or two of the velvet bents seem especially promising both for turf and for seed production. A number of selfed strains of the bent grasses are being propagated in order to study the amount of natural crossing taking place and also the inheritance of certain characters. Plats grown from open pollinated seed are also compared with the original plats where the seed was grown and with plats planted with selfed seed.

Fertilizer Needs of Rhode Island Bent. A seed crop of Rhode Island bent was again harvested from these plats. As was the case the previous year, the best results were obtained with fertilizers having a high-nitrogen content.

Animal Breeding and Pathology

(Experiments with Poultry)

Internal Disinfectants. Further tests have been conducted this year on the use of certain chemicals as internal disinfectants. *Shigella gallinarum* (fowl typhoid organism) was used as the infecting agent instead of *Salmonella pullorum* which has been used in previous work. Baby chicks were inoculated and the compounds metaphin and poly-comp were used in various dilutions as disinfectants. The former, metaphin, has the chemical formula: 4-nitro-3, 5-bisacetoxymercuric-2-cresol. Poly-comp is a Jensen-Salsbery Laboratories preparation containing: Guaiacol, 1 ½ per cent; creosote 5 per cent; methyl phenol-13, ½ per cent; oil of eucalyptus 5 per cent; oil of camphor Japanese 45 per cent, in a saponaceous base. The results indicate that these disinfectants are of doubtful benefit in the control of fowl typhoid in baby chicks.

Pullorum Disease. During the year 1929-30 considerable work has been carried on with regard to the ability of *Salmonella pullorum* to grow in various synthetic media. Experiments have been made particularly with the ability of the organism to utilize uric acid as a source of nitrogen. To date nothing of a definite nature can be reported. Studies were also made on the ability to utilize citric acid as a sole source of carbon. The results indicate that the majority of the *Salmonella pullorum* strains are able to attack citric acid.

Experiments are being conducted on the resistance of *Salmonella pullorum* to chlorine in the presence of egg albumen. An immediate practical application arising from these experiments is seen when it is noted that egg shells from factories where great quantities of eggs are used, are being fed to poultry as a source of nutrient lime. There is evidence that pullorum disease has been transmitted to healthy flocks by means of these shells and therefore some practical means of quick disinfecting may be of value.

Fowl Pox. Progress has been made in the study of vaccines. Fowl pox viruses are being tested for deterioration due to storage conditions, age, heat, light, and oxidation. Work is also in progress on the attenuation of virus by heat and by chemicals. This experiment is now in its seventh month and two viruses have succumbed. One was preserved in phenol solution and the other was heated to 60° C. for 30 minutes.

Vaccination has been completed in connection with the study of the duration of immunity conferred, effect of age upon extent of immunity and relative susceptibility of some of the leading breeds. Periodical observations will be taken to secure data on the above points.

Coccidiosis. During the year 1929-30 an experiment was begun on the longevity of coccidia in soils of different types. Soils were successfully contaminated and should furnish information on this point during the coming year. Work is projected with resorcinol compounds as therapeutic agents.

Chemistry

Soil Nitrate Nitrogen and Vegetable Crops. The growth season of garden beets was divided into three equal periods, and 17 different combinations of low (10 p. p. m.), medium (25 p. p. m.), and high (50 p. p. m.) levels of soil nitrate nitrogen compared for the different periods. The beets were grown in cylinders and the desired levels maintained by biweekly analysis of the soil and replacement of nitrate losses by applications of nitrate of soda in solution. The best yield of salable roots resulted from a level of 50 p. p. m. of nitrate nitrogen during the first two periods and 10 p. p. m. for the last period. Reduction of the level for the middle period to 25 p. p. m. approximated the normal course of nitrate removal from a single application of nitrogen at planting time and produced a very satisfactory yield. Low yields resulted when nitrates were low during the first period. Spinach, treated similarly except that the growth was divided into but two periods, gave the best yields when the high level (50 p.p.m.) was maintained continuously for both periods.

These results advocate higher levels than were previously considered necessary but were borne out by results from field plats. An average concentration of 40 p. p. m. of nitrate nitrogen gave a crop of 529.8 bushels of late beets while 23 p. p. m. for the first half of the growth period and 6 for the last reduced the yield to 388 bushels. For fall spinach, an average of 60 p. p. m. throughout the growth period produced a yield of 2547.5 bushels while 27 p. p. m. gave but 1980 bushels.

During the dry season of 1930, a single application of soluble nitrogen at planting time maintained somewhat higher soil-nitrate levels during the critical growth periods of lettuce, tomatoes, cabbage, celery, beets, spinach, and onions than did fractional applications supplying equal total quantities of nitrogen. The differences in yields were insignificant.

Nitrates in Plant Juices. An attempt to control the concentration of nitrate nitrogen in the juice of the midrib-free portions of beet leaves growing in sand on greenhouse benches during the winter proved successful for the rather wide limits allowed. After the plants were 3 inches high, three comparative treat-

ments in duplicate were maintained between the limits of 0-150, 150-300, and above 300 p. p. m. of nitrate nitrogen until the high nitrogen crops were well grown. Nitrate of soda applications were made in solution on the basis of both plant and sand analysis at frequent intervals. With increasing day length and rapid metabolism in the large leaves of the maturing crop in the spring, the 300 p. p. m. concentration could not be maintained. The yields of roots for the levels mentioned above were 2.5 pounds, 16.4 pounds, and 19.1 pounds respectively.

During the summer two successive crops of beets were grown in 1/1000-acre soil areas in the field. Three levels of nitrate nitrogen, 10, 25, 50 p. p. m. were maintained in the soil by biweekly analyses and subsequent applications of nitrate of soda in solution. Nitrate, ammonia, amide, and alpha-amino nitrogen fractions were determined each week in the juice expressed from the midrib-free portions of leaves. The nitrate fraction has correlated closely with the nitrates in the soil but the differences for the three treatments were not great. Fluctuations in nitrates caused by changing rates of metabolism were very wide despite the control of soil levels. The concentrations varied from traces to 300 p. p. m. of nitrate nitrogen, but were usually less than 150 p. p. m.

Ammonia and amide nitrogen fluctuated less than did the nitrate fraction, but the different treatments had little effect on these forms of nitrogen. Concentrations of amide nitrogen varied from 10 to 190 p. p. m. but were usually less than 100 p. p. m. The ammonia-nitrogen fraction approximated 40 p. p. m. Alpha-amino nitrogen fluctuated more widely than nitrate nitrogen, 100 p. p. m. to 600 p. p. m., but showed a tendency to correlate with the different treatments.

The yield of roots for the 10 p. p. m., 25 p. p. m., and 50 p. p. m. levels were 17.8 pounds, 25.4 pounds, and 25.7 pounds respectively, for the early crop and 12.1 pounds, 14.3 pounds, and 15.8 pounds for the late crop. The latter did not mature before frosts.

Small beet leaves were found to contain higher concentrations of nitrate nitrogen than larger leaves, probably because of the

greater proportion of conducting tissue, chiefly midrib, to the total weight, and to the fact that nitrates in the juice from the midrib are more concentrated than in the remainder of the leaf.

Acid-base Balance of Plant Ash. A simple method for determining the acid-base balance of the non-silicious portion of plant ash including the sulphur and chlorine often lost in ashing was devised, and 90 samples representing a number of different crop species were analyzed. All samples showed an excess of alkaline elements. Season and fertilization affect the balance for individual plant species, but crops from a moderately fertile soil (ph 5.5) suggest the following grouping: *Low alkalinity,* corn, oats, rye, timothy, redtop, potatoes; *medium alkalinity,* millet, alsike, red clover, cabbage, rutabagas; *high alkalinity,* buckwheat, mangels. There was a tendency, not without notable exceptions, for increased alkalinity from increased nitrogen fertilization. Increased superphospate decreased the alkalinity of the ash from rape grown at two levels of pH (5.2 and 6.5) but did not affect the ash of oats grown on the same soils. There was no significant correlation with pH for either crop.

Phosphate, Absorption by Soils. More thorough study of the removal of phosphate from buffer solutions of potassium dihydrogen phosphate-sodium acetate by soils confirmed the conclusions of last year that normal phosphate fertilization during a period of 35 years has not reduced the power of phosphate absorption significantly. This was irrespective of the carrier used, superphosphate, bone, floats, slag, or triple superphosphate. A high rate of liming, sufficient to change the acidity from pH 5.6 to 7.5 within the same period has reduced the power of absorption. Phosphate was absorbed from the buffer solutions when adjusted to pH 5, 6, and 7, but was given up by the soil at pH values of 2 and greater than 10.

Feed and Fertilizer Controls. Four hundred samples of feeds and fertilizers taken from stocks sold in the state were analyzed to show compliance of manufacturers with the state law. Publications containing tabulations of the results and displaying prominently the more flagrant failures to meet guarantees have been placed in the hands of farmers in the state.

Home Economics

Use of Time by Rural Rhode Island Homemakers. During the past year this project which had been carried on for several preceding years has been completed. Bulletin 221 entitled, "Time factors in the business of homemaking in rural Rhode Island," shows results which in many cases are strikingly similar to those found by workers on the same project in several states in different sections of the country. The Rhode Island homemaker spends an average of 1 hour and 5 minutes a week more in house work than the homemakers in Montana,* Oregon, and Washington. This small difference may be partly accounted for by the fact that she does very little farm work while the women of the three other states reported an average of 10 hours or more a week in such work.

The Rural Homemaker in Washington County and Frequency of Paid Work. Another interesting comparison appears in the relatively large amount of time spent by the Rhode Island homemaker in some kind of work for financial gain. Further study of this last fact is being made and some very interesting data have already been collected concerning the homemaker who does work which adds to the family income. One of the outstanding points of interest in the study thus far is the wide variety of ways by which women in villages or even in quite isolated locations have been able to earn money. The large number of summer resorts in Washington County offers to many women opportunities for paid services in laundering and other cleaning; housework of all kinds; the opening and closing of summer houses, and the sale of cooked foods. Wayside stands, rooms and camps for tourists as well as lunch and tea rooms provide an opportunity for many homemakers to earn money without leaving home. Among the 78 different ways listed by 388 wage-earning homemakers already visited are found the following: Employment bureau, real-estate agency, retouching plates sent from a large photographic business in a Connecticut city, boarding dogs, renting boats and selling bait, sewing fish lines on

*From the thesis submitted by Blanche M. Kuschke toward the degree of M.S. in Montana State College, 1930, "A study of the factors that may affect leisure time of rural homemakers in Montana."

cards for a factory, running a riding academy, raising turkeys, and acting as census taker and reporter. One has a large interior decoration business, another is an author, and many are teachers, librarians, nurses, clerks, stenographers, telephone or telegraph operators, or mill workers. The large numbers of tourists also provide opportunities for sale of many home-craft products such as woven, braided or hooked rugs, hand-colored cards, and fancy work.

Potash Fertilizer as Related to Mealiness in Potatoes. The study of the effect of variations of potash fertilizer on the mealiness of potatoes when prepared for table use was completed. A summary of results was published in an article in the October issue of the American Potato Journal. From this work it appears that potatoes are more mealy when fertilized with a high than a low quantity of potash. The percentage of starch in the potato does not seem to determine its mealiness when cooked.

Household Equipment Study. A project is under way to find the dimensions which determine the efficiency of pouring utensils. A large variety of articles has been loaned by manufacturers of china, glass, aluminum, and other metal utensils. These are being tested for their rate of emptying without spilling, their completeness of emptying, and their freedom from liquid running down the outside. A machine for controlling the pouring has been constructed in cooperation with the engineering department of the college and tests are being made with water and oils and syrups of tested viscosity and surface tension.

Influence of Fertilizer Treatment on the Vitamin Content of Spinach. The Department of Biological Chemistry of the Pennsylvania State College reports that the results of the joint project are not yet definite enough for much positive statement. Samples of spinach grown at the Rhode Island experiment station with variations in the amount of phosphorus, potassium, nitrogen, and manganese have been dried and shipped to Pennsylvania for feeding to rats to test their vitamin A content. The only positive result up to the present is the fact that the chlorotic spinach produced by the low manganese plats shows less vitamin A than normal spinach.*

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* Forty-third Annual Report of the Pennsylvania Agricultural Experiment Station, Bulletin No. 258, p. 8.

Plant Physiology

(Glasshouse Experiments)

Acid Soils. Three crops thought to be sensitive to acid-soil conditions were grown in pot cultures of 16 soils secured from different parts of the country. Lettuce proved to be too sensitive as practically no growth took place on the more acid soils. Sorghum was not sensitive enough, giving no outstanding differences on soils of known hydrogen-ion variation. Barley was chosen as being best adapted to the study.

The hydrogen-ion, lime requirements, and "active" aluminum content of the soils were determined.

The dry-weight yields of barley were found to correlate better with the "active" aluminum content of the soils than with acidity.

Solution cultures of Cos lettuce seedlings grown in a pH range of 3.2 to 7.5 showed no appreciable difference in dry-weight yields while cultures to which aluminum sulphate had been added were much depressed in yield.

From these studies further evidence has resulted to indicate that in soil and solution cultures "active" aluminum has a greater inhibitory effect on the growth of lettuce and barley plants than acidity.

Indicator Crops. A study of a number of plants has been commenced in an attempt to discover indicators of nutrient deficiencies. A soil of known nutrient deficiency was used and to it different combinations were added in the form of soluble salts. The plants were grown in small pots, each culture being in quadruplicate. They were harvested as soon as definite growth differences were noted and the dry weights determined. Macomber turnips have proven to be very sensitive to lack of phosphorus while buckwheat best indicates nitrogen deficiency.

No plant has been found as yet which is selective as to potash deficiency and yet can be grown under the conditions of the test. Pure lime strains of corn when grown in this test through the seedling stage responded to nitrogen alone, contrary to former

data which showed that the yield of grain is very responsive to potash fertilization.

Winter Tomato Culture. The crop of Carter's Early Sunrise tomatoes which was grown during the winter of 1929-30 yielded from 3 to 9 pounds per plant.

Soil-nitrate levels were maintained as close to 50 p. p. m. of nitrate nitrogen as possible by frequent soil sampling and laboratory tests. This level seems to be too high for the best yield of fruit.

If a difference of 20 per cent in yield be considered significant the various sources of organic matter used in this experiment had no significant effect on yield with this particular crop.

Winter Gladiolus Culture. California-grown stock flowered for the Christmas trade. Stock grown in Connecticut was planted only 15 days later than the California stock and did not flower until April, showing the necessity of allowing ample time to elapse for the after ripening of the corms before planting.

A spring planting made on March 1, 1930, bloomed in May and gave high percentages of bloom.

Pomology

(Experiments with small fruits)

Fertilizer Experiments with Brambles and Grapes. On the red raspberry plats the omission of potash still continues to give outstanding reductions in yield and growth of plants while the results from plats where nitrogen or phosphoric acid have been omitted varied but little from the complete fertilizer plats.

As in the previous years of this experiment blackberries were damaged quite seriously by freezing-back. Even on the hardier varieties such as Snyder, El Dorado, and Mersereau, the yields were too small to be of significance due to the freezing-back of cane growth.

No definite conclusion connected with deficiencies in plant food can be drawn as yet from a yield of grapes in this experiment. The vegetative growth, however, seems to be less vigorous

where potash has been withheld. Here again the freezing-back of the vines each winter makes it doubtful whether growth differences are true indications of response to fertilizer treatments.

Graftage Congeniality of Grapes. In connection with this project it has seemed necessary to determine the relative hardiness of the varieties in the test to the Rhode Island Coastal Plain conditions. Of the 40 varieties of vinifera obtained from American sources not more than 10 are likely to prove satisfactory. There are indications that the varieties imported from Germany are likely to be more successful.

Attention is being focused on the methods of culture of those varieties of vinifera which are proving hardy. Some data have been secured pointing to the need of high applications of stable manure in order to secure good growth.

Preliminary grafts with cions grown in California, on Concord, Clinton and Beta stock have given excellent unions. These grafts have given better growth than the same California varieties grown at this station.

Blackberry Breeding Experiments. Plants were grown from seeds secured by cross-pollination in 1929. Two plants have been selected from crosses between thorny and thornless parents which appear to have inherited the thornless character. If these on further development should prove to have other desirable characteristics one objective may have been attained, namely, a hardy thornless blackberry of good size and quality.

During the summer of 1930 further crosses were made and seeds secured.

Survey of Orcharding. Bulletin No. 226 gives the results of a survey of orcharding practices as found during the years 1925-27. The history of apple growing in Rhode Island is also discussed.

From the survey it would seem that marketing direct to comsumers should be given more consideration, especially from the standpoint of varieties which will satisfy the demands of discriminating buyers. Nearly 125 different varieties were met with in the surveys or listed by premium lists of Rhode Island fairs

and fruit shows. Many of these are of no practical value and the trend of commercial growers is toward fewer varieties and larger orchards.

Weather

On March 1, 1930, the resignation of Nathaniel A. Helme as Meteorologist was reluctantly accepted. Mr. Helme had given continuous service in the taking of weather records for more than 40 years during which period he was a member of the station staff for 37 years. Such length of faithful service is surely deserving of more than passing notice.

Table 1 gives the average temperature and average total rainfall for five-day periods computed from the entire 40 years of Mr. Helme's records.

TABLE 1

AVERAGE TEMPERATURE AND AVERAGE TOTAL RAINFALL BY 5-DAY PERIODS FROM JANUARY 1, 1890 TO DECEMBER 31, 1929

PERIOD	Average temperature °F.	Average total rainfall Inches	PERIOD	Average temperature °F.	Average total rainfall Inches
Jan. 1-Jan. 5	27.5	0.81	July 5-July 9	68.4	0.43
Jan. 6-Jan. 10	27.6	.70	July 10-July 14	69.7	.55
Jan. 11-Jan. 15	26.7	.96	July 15-July 19	70.0	.62
Jan. 16-Jan. 20	27.1	.80	July 20-July 24	69.3	.66
Jan. 21-Jan. 25	29.0	.90	July 25-July 29	69.0	.45
Jan. 26-Jan. 30	25.6	.57	July 30-Aug. 3	68.6	.68
Jan. 31-Feb. 4	25.5	.67	Aug. 4-Aug. 8	69.3	.62
Feb. 5-Feb. 9	25.4	.82	Aug. 9-Aug. 13	69.4	.85
Feb. 10-Feb. 14	25.4	.68	Aug. 14-Aug. 18	67.8	.66
Feb. 15-Feb. 19	26.9	.69	Aug. 19-Aug. 23	66.6	.51
Feb. 20-Feb. 24	28.2	.96	Aug. 24-Aug. 28	66.4	.97
Feb. 25-March 1	29.1	.99	Aug. 29-Sept. 2	65.4	.52
March 2-March 6	30.7	.66	Sept. 3-Sept. 7	65.2	.77
March 7-March 11	33.0	.96	Sept. 8-Sept. 12	63.4	.55
March 12-March 16	34.7	.87	Sept. 13-Sept. 17	61.9	.53
March 17-March 21	34.7	.79	Sept. 18-Sept. 22	60.8	.80
March 22-March 26	38.8	.64	Sept. 23-Sept. 27	58.7	.46
March 27-March 31	39.2	.66	Sept. 28-Oct. 2	56.4	.52
April 1-April 5	40.1	.79	Oct. 3-Oct. 7	56.1	.48
April 6-April 10	42.2	.96	Oct. 8-Oct. 12	53.2	.66
April 11-April 15	43.4	.82	Oct. 13-Oct. 17	52.6	.64
April 16-April 20	44.9	.71	Oct. 18-Oct. 22	50.3	.85
April 21-April 25	47.8	.63	Oct. 23-Oct. 27	48.9	.89
April 26-April 30	48.6	.84	Oct. 28-Nov. 1	46.5	.55
May 1-May 5	50.3	.67	Nov. 2-Nov. 6	44.5	.82
May 6-May 10	52.9	.63	Nov. 7-Nov. 11	42.5	.55
May 11-May 15	54.1	.65	Nov. 12-Nov. 16	41.1	.57
May 16-May 20	55.4	.59	Nov. 17-Nov. 21	39.8	.71
May 21-May 25	56.1	.74	Nov. 22-Nov. 26	37.9	.79
May 26-May 30	58.0	.63	Nov. 27-Dec. 1	35.1	.72
May 31-June 4	60.8	.36	Dec. 2-Dec. 6	32.8	.89
June 5-June 9	60.7	.76	Dec. 7-Dec. 11	31.1	.64
June 10-June 14	62.2	.67	Dec. 12-Dec. 16	30.7	.92
June 15-June 19	63.2	.54	Dec. 17-Dec. 21	29.6	.61
June 20-June 24	65.4	.52	Dec. 22-Dec. 26	29.7	.85
June 25-June 29	66.6	.46	Dec. 27-Dec. 31	27.9	.92
June 30-July 4	67.2	.62			

In order to assure continuity of records a meteorological station has been established in cooperation with the U. S. Weather Bureau on the plain farm with William J. Champlin in charge.

The latest frost in the spring of 1930 took place on the plain on May 31 with a temperature of 30° F.* Tomatoes were severely damaged while potatoes were slightly frosted. October 19 the first fall frost was recorded and soybeans, peppers, dahlias, and beets were damaged. A killing frost took place on October 21 with a temperature of 18° F.

During the growing season of 1930, the greatest departure from normal climatic conditions was noted with rainfall. The departures month by month were as follows:

	Inches below normal
April,	3.01
May,	0.63
June,	0.83
July,	0.12
August,	1.82
September,	2.11
October,	1.26

Late crops on the plain farm suffered appreciably due to the low moisture conditions. Second cuttings of alfalfa and hay were reduced in yield from normal as much as 50 per cent. Fall turnips were a complete failure and late cabbage produced about one-third of a normal crop. On the market-garden area the yield of carrots was reduced from 20 to 25 per cent by the dry soil conditions.

Publications

Forty-second annual report of the station. Bul. of Rhode Island State College 25: 63-79.

Transmission of pullorum disease from chick to chick. Poultry Science 9: 176-183.

Report on nitrogen activity methods in fertilizers. Determination of active water-insoluble nitrogen by the alkaline permanganate method. Jour. Assoc. Off. Agr. Chem. 13: 215-219.

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* Climatological Data, New England Section, of the U. S. Dept. of Agriculture Weather Bureau.

The chemical diagnosis of nitrogen starvation in growing crops. Pub. of N. E. Chem. Teachers' Assoc. 13: 72-74.

The adaptation of the Benedict-Denis method to the determination of sulfur in plants. Jour. Biol. Chem. 86: 285-289.

Estimation of nitrate nitrogen in plant Juices: A study of the expression and clarification of the juice. Plant Physiology 5: 359-371.

The effect of chemicals in the control of poultry disease. III. The use of metaphen as an internal disinfectant. Poultry Science 9: 371-376.

Inspection of feeds. Annual Feed Circular, May, 1930, 12 p.

Costs of cooling milk on farms. R. I. Agr. Expt. Sta. Bul. 223, 13 p.

The clarification of plant juices: Nitrate concentration in large and small leaves. Science 72: 634-635.

A method for the estimation of the acid-base balance in the ash of plants. Jour. Biol. Chem. 88: 675-681.

The relation between mealiness in potatoes and the amount of potash in the fertilizer. Amer. Potato Jour. 7: 275-283.

Fertilizer and crop rotation experiments. R. I. Agr. Expt. Sta. Bul. 224, 42 p.

Inspection of fertilizers. Annual Fertilizer Circular, September, 1930, 17 p.

The amount of manure necessary for vegetable growing II. R. I. Agr. Expt. Sta. Bul. 225, 31 p.

Some phases of apple growing in Rhode Island. R. I. Agr. Expt. Sta. Bul. 226, 36 p.

Respectfully submitted,

BASIL E. GILBERT,

Director.

Kingston, R. I.
January 1, 1931.

RHODE ISLAND STATE COLLEGE
REPORT OF
THE EXTENSION SERVICE
1930

ACTING PRESIDENT JOHN BARLOW:

SIR:

I am herewith submitting my annual report as Director of the Extension Service as conducted cooperatively with the United States Department of Agriculture and County Farm Bureaus. This report records the achievements for the 29th year of Agricultural Extension Work in Rhode Island as by law required.

A. ADMINISTRATION.

Organization.

The Extension Service is in cooperation with the United States Department of Agriculture and the three Rhode Island Farm Bureaus organized to conduct a state wide educational service with men, women, and children in agriculture and home economics. The organization, at present is composed of a Director who also acts as State Leader of County Agents and Dean of Agriculture in the College, two full-time State Leaders, five part-time Specialists, and nine Agents resident in counties, three as Agricultural Agents, three as Home Demonstration Agents, and three 4-H Boys' and Girls' Club Agents.

Cooperation.

As in years past there has been the closest cooperation between the State Board of Vocational Education, Extension Service, and Farm Bureaus in the conducting of evening schools for the discussion of topics related to animal husbandry, fruit, and poultry culture. Continued cooperation has been received from the State Department of Agriculture in connection, particularly with problems related to insect control and forestry. The Director of the Experiment Station and his staff of workers have

made available much valuable material of an economic nature and have assisted materially in the dissemination of information regarding vegetable growing.

The fourth annual meeting of the New England Institute of Cooperation held its sessions at this institution June 18 to 21, 1930. The general theme of this meeting was farm organization and efficient marketing. The attendance was the largest at any of the meetings yet held.

Fair Exhibits.

The Farm Bureaus have placed excellent exhibits at all of the Agricultural Fairs held in the State. Especially interesting was the exhibit of boys' and girls' club work and of women's work staged at the Pawtuxet Valley Fair. At the fall exhibit of the Rhode Island Fruit Growers' Association a display of fruit was staged showing varieties, packages, and by-products.

Sources of Revenue.

The income during the fiscal year ending June 30, 1930, as reported to the United States Department of Agriculture, comprised the following items:

Federal Capper-Ketcham Funds	$20,147.57
Federal Smith-Lever Funds	11,680.24
State Smith-Lever Funds	1,680.24

United States Department of Agriculture funds allotted to Rhode Island

County Agent Work	$2,610.00
Home Demonstration Work	2,400.00
Boys' and Girls' Club Work	2,140.00

Equipment.

The expenditures for new equipment have been used for adding to the office equipment and has included new bookcases, typewriter desks, and a folding machine. The laboratory equipment of the poultry specialist has been improved by the purchase of a high power microscope and accessories.

Personnel.

In the year from July 1, 1929, to June 30, 1930, the following changes have occurred in the department:

A. A. Thornton, county agent in the Southern Rhode Island Farm Bureau district, resigned, effective July 31, 1929, to enter school work. The position thus made vacant was filled by the appointment of R. S. Shaw, effective October 15, 1929.

The greatest number of changes have occurred in the Home Demonstration agents. Lillian E. Blanding, home demonstration agent in Eastern Rhode Island, resigned September 15, 1929. The position thus made vacant was filled by the appointment of Nettie H. Simmons, on October 15, 1929.

Nora M. Hott, home demonstration agent in Southern Rhode Island, resigned February 22, 1930. The position made vacant by Miss Hott's resignation was not filled until after July 1.

Publications.

Two Extension bulletins have been published.

Bulletin No. 52, Rhode Island 4-H Foods Clubs,
Margaret Whittemore, August, 1929.

Bulletin No. 53, Annual Report of Rhode Island State College Extension Service, G. E. Adams, June, 1930.

In addition to the printed material the mimeographed monthly service sheets dealing with agronomy, animal husbandry, fruit, poultry, and vegetable gardening have been continued. Special series of news articles and mimeographed letters have been prepared in connection with the spray program and the grow healthy chicks work.

News articles have been sent regularly to the agricultural papers of the State and much valuable publicity obtained.

County Agent Work.

As in years past the poultry project has required the most attention on the part of the county agents, they having devoted 197 days to the project. Increased efficiency on the part of the poultrymen is seen as a result of this work.

The dairy husbandry work has called for the next largest amount of time, 152 days being devoted to this work which in addition to advice regarding general subjects of interest to the dairymen included organization work in Northern and Southern Rhode Island of two dairy herd improvement associations in which there are enrolled a total of more than 1,500 animals owned by sixty-six dairymen.

The outstanding piece of work under the fruit project was the development of the spray service which gave timely advice directly to 207 fruit growers who had requested the information and to an unknown number who listened to the radio broadcasts sent out from the two largest Providence stations.

Marked progress, although difficult of estimation, was made in the agronomy project which had for its main objective an increase in acreage of leguminous crops grown for roughage.

Farm Management survey records were secured on 146 farms. This economic data is proving of much value in the development of our extension programs.

Miscellaneous work has included, as in years past, work with the corn borer, European earwig, and rodent control, woodchucks, rats, and orchard mice.

In the conduct of this work the agents have made a total of 1,518 farm visits, received 807 office calls, 1,297 telephone calls, written 2,490 individual letters, published 175 news articles, all of which has required a total of 874 days of which 417½ were spent in the office and 456½ in the field.

Home Demonstration Work.

The Home Demonstration work has been somewhat hampered during the year by the resignation of two of the county agents. Marked progress, however, has been made in the development of the local leader training work. As a result of the increased interest stimulated through the local leadership the membership in groups has increased from 539 in 1929 to 1,579 this year.

The second Woman's Camp held at the college had an attendance of 150. At this camp committees were appointed for the development of long time programs in clothing, foods and nutri-

tion, and for the study of home conditions. Discussions were held with leaders each day of the camp and at the last group session of the camp the findings of the committees were reported with recommendations of programs to be carried on through local leader training schools.

Boys' and Girls' Club Work.

Club work still continues to show a healthy growth. The enrollment of individuals having increased from 2,590 in 1929 to 2,862 this year, or an increase of 14 per cent. The improvement in work is shown not so much by increase in the individual enrollment which increased only 14 per cent as in the number of projects which were completed and fulfilled all of the requirements necessary to obtain an achievement badge. Project completions increased 68 per cent during the year. During the past years stronger leader training programs have been developed through the holding of district and county-wide leader training meetings. Town and county achievement days inaugurated for the first time this year in each farm bureau district have done much to assist in raising the standard of quality in the minds of the youth.

The work with the club members has been strengthened through the development of a 4-H honor organization previously known as "The Councilors" but now associated with the interstate organization "The 4-H All Stars."

The completion of five years of the health project shows a steadily increasing enrollment in this project and a completion percentage above that of the projects in agriculture and home economics. For the past two years more records have been submitted in relation to health than in all other work combined. As a result of the five years' work, records show that 8,500 defects in posture, nutrition, etc., have been improved as a result of the health program.

Camp Edwards was again the outstanding event in Club Work, for the year, within the State. In addition to the State activities 4-H Club members have attended Camp Vail, the interstate 4-H Camp at Springfield, the National 4-H Camp at Wash-

ington, and the National 4-H Congress at Chicago. Club members from Rhode Island have been heard in national radio programs on two occasions, the first in the January monthly National Club Hour and the second in one of the national broadcasts of the 4-H Club Congress at Chicago.

Agronomy.

Agronomy work has been conducted along the line of increasing the amount of high quality hay grown on Rhode Island farms, improvement of pastures, better varieties of corn for silage, and a systematic rotation of crops. As the largest single expenditure on dairy farms in Rhode Island is that for purchased grain, particular emphasis is being placed upon the development of a home-grown supply of high protein hay. That this program is being accepted by dairymen is shown by the large increase in sales of lime and legume seeds reported by dealers in Rhode Island.

Pasture improvement work shows that under the proper conditions very profitable results may be obtained from the application of commercial fertilizers to pasture areas.

The European corn borer still continues as a serious menace to the corn growing industry in the State. As a means of reducing these injuries, demonstrations with early maturing varieties of silage corn have been conducted. The unprecedented drought of the past season has in many cases influenced the yields to such an extent that no satisfactory records have been obtained. The indications are that the earlier maturing varieties will prove more saisfactory than many of the long season types now grown.

Animal Husbandry.

The better bull campaign has continued to make marked progress. Since its inauguration in 1926, 290 better bulls have been placed on dairy farms of the State. This year the placements have consisted of thirty-two Holsteins, twenty-two Ayrshires, twenty Guernseys, and one Jersey. Better calf raising practices have been adopted by twenty-eight dairymen. Reports show that 107 dairymen have changed feeding practices during the year as a result of recommendations from the Extension Ser-

vice. Two dairy herd improvement associations have been organized and active work started on November 17.

Fruit Growing.

The outstanding development in the fruit growing work this year has been the establishment of the Spray Service. This Spray Service was organized to give timely information as to when and with what materials to spray the apple orchards. The information was given to the individual grower in three ways. First, through key men in each fruit area who received information direct from the county agents' offices over the telephone, this information being relayed by them to the other growers in their district having telephone connections. Second; postal card communication sent to each one enrolled. And third, radio announcements stating the spray to be applied and material to be used sent out over the two largest stations in Rhode Island.

Orchard demonstrations in pruning, grafting, and dusting have been conducted. The effectiveness of this work may be shown in part by the results obtained in the orchards where the owners desired their fruit examined to determine if it were 90 per cent free from insect and disease blemishes. In order to qualify for the 90 per cent Clean Apple Club it was necessary that at least 100 bushels of the variety entered should have been grown on the farm. In 1929 no grower who requested an examination of fruit produced, fulfilled the requirements. This year nine growers obtained membership in the 90 per cent Clean Club.

Poultry.

Poultry work has shown a steady growth and has been conducted again along the lines of the Grow Healthy Chicks campaign, testing for Bacillary White Diarrhea (the Pullorum disease) and encouragement of Record Keeping. Progress in the Grow Healthy Chicks campaign is shown by the following figures:

	1927	1930
1. No. poultrymen enrolled	201	441
2. No. chicks enrolled	134,893	466,365
3. Poultrymen reporting	115	252
4. Mortality of all chicks	18.1%	11.8%
5. Mortality of chicks where all details of plan were followed	11.0%	7.4%

Pullorum Disease Work.

1925-1926, 8,175 birds were tested on sixteen farms with 6.97 per cent reactors.

1929-1930, 20,638 birds were tested on thirty-eight farms with 4.4 per cent reactors.

Two flocks were found free of the disease and in flocks where two or more breeds were kept one breed in each of four flocks was found free.

In order to encourage the keeping of records seventy-five poultrymen have been induced to keep egg records during the past year. These records have been tabulated at the end of each month and a statement returned to the owner of each flock giving detailed results for the month.

Due to the increase in the prevalence of chicken pox in the flocks of the State it was deemed advisable to inaugurate prevention work against this disease. Scab material was prepared and distributed to fifty-one poultrymen in the State who inoculated 31,075 birds.

Outlook.

Extension work is being more freely accepted with each passing year and with the accumulation of economic material from studies of local conditions more efficient programs of work are being planned and developed. With the promise of assistance during the ensuing year from the Federal Extension Service, the outlook for placing our extension program on a firm basis is brighter than ever before.

As mentioned in previous reports, the greatest need of the Extension Service is an improvement in the financial condition of the Farm Bureaus in order that they may have funds sufficient to employ adequate clerical staffs. The limited finances of the local Farm Bureau and its effect upon resident Agent work is shown in the resignations of Agents in two of the Farm Bureau districts this year who resigned to accept positions in other states at an increase in salary and employment in at least one case where a definite schedule of promotion is in force.

During the current fiscal year the Extension Service has been unable to accept the benefits of the Federal Deficiency Appropriation Bill which included $1,000,000 "for additional cooperative agricultural extension work, including employment of specialists in economics and marketing to be allotted and paid by the Secretary of Agriculture to the several States and Territory of Hawaii in such amounts as he may deem necessary to accomplish such purposes." Of this sum $5,000 was allotted to Rhode Island. Advantage could not be taken of this appropriation owing to the fact that there were no funds which could be used for matching as by law required. A change in the present State law appropriating money for the support of local Farm Bureaus could be made which without increasing the State expenditures, would assure to the State this additional sum of money in the years to come.

In closing this report I wish again to express my appreciation to all of the Extension workers for the cooperation shown during the past year and to again express my appreciation of the assistance rendered by Director Gilbert of the Experiment Station and his staff of workers.

Respectfully submitted,

G. E. ADAMS,

Director.